

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF HAWAII

In the Matter of

PUBLIC UTILITIES COMMISSION

Instituting a Proceeding to Investigate the
Implementation Of Feed-in Tariffs.

DOCKET NO. 2008-0273

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**BLUE PLANET FOUNDATION'S COMMENTS ON HAWAIIAN
ELECTRIC COMPANY, INC., HAWAII ELECTRIC LIGHT COMPANY,
INC., AND MAUI ELECTRIC COMPANY, LIMITED'S RELIABILITY
STANDARDS REPORT FILED FEBRUARY 8, 2010**

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STANDARDS REPORT FILED FEBRUARY 10, 2010**

Blue Planet Foundation ("Blue Planet"), by and through its attorneys Schlack Ito Lockwood Piper & Elkind, and pursuant to the Commission's March 11, 2010 Order Granting Extension Request in the above-captioned matter, hereby submits its comments ("Comments") on the Hawaiian Electric Company, Inc. ("HECO"), Hawaii Electric Light Company, Inc. ("HELCO"), and Maui Electric Company, Limited's ("MECO") (collectively, "HECO Companies") Reliability Standards Report filed February 8, 2010 ("HECO RS Report") as follows.¹

I. INTRODUCTION

As noted in Blue Planet's Comments filed February 15, 2010, but for the recent Working Group proposal, Hawaii's landmark Feed-in Tariff ("FIT") docket appears to be drawing to a close. The Commission initiated the investigation into a Hawaii FIT by order filed October 24, 2008 and issued its seminal 101-page Decision and Order on September 25, 2009.

¹ As more fully explained in its prior submissions in this proceeding, Blue Planet submits that the HECO RS Report does not constitute or set forth reliability standards equivalent to North American Electric Reliability Corporation bulk electric system reliability standards, but rather seeks to set forth the basis for establishing caps or limits on energy added to the HELCO and MECO systems by FIT projects. *See, e.g.*, Blue Planet Foundation's Response to HECO/Blue Planet-IR-1 filed Mar. 1, 2010 at 4-5.

The Decision and Order established a FIT for Hawaii. Since that time, the Commission and parties have worked diligently to develop the tariffs necessary to implement the FIT. The tariff for Tiers 1 and 2 of the FIT is pending Commission approval, and the Tier 3 tariff is expected to be completed for Commission review and approval on May 13, 2010. The parties are making similar progress on resolving queuing and interconnection issues. The only remaining substantive issue appears to involve the HELCO and MECO systems.

Blue Planet proposes that the Commission direct the HECO Companies to implement the FIT fully on the HECO system² and in phases on the HELCO and MECO systems without delay. (Blue Planet submits the record supports both full and phased implementation of the FIT on the HELCO and MECO systems, but for purposes of these Comments focuses on phased implementation.) For phased implementation, Blue Planet proposes two phases which should apply to each company. Each phase would last approximately one year. During each phase, it is assumed that up to 5 megawatts ("MW") of primarily solar photovoltaic ("PV") energy would be added to the HELCO and MECO systems. More specifically, during Phase 1 FIT projects for each company would be limited to project sizes established under Tiers 1 and 2 of the FIT and nameplate capacity equal to 2.5% of the 2008 system peak demand. Phase 2 would commence upon the conclusion of the first twelve months of the FIT, or upon Commission approval of formal reliability standards and the application of those standards to

² The procedural steps concerning the Tiers 1 and 2 Tariff identified in the October 29, 2009 Order Setting Schedule have been completed. The HECO Companies' consultant, BEW Engineering, states in its February 8, 2010 report on the HECO system that "an initial DG [distributed generation] penetration level of 60 MW is deemed feasible, based on a high level steady state scenario analysis." HECO RS Report, Attachment 1 to Exhibit 1 at 2. The HECO Companies affirm in their February 26, 2010 letter to the Commission that they "remain firmly committed to moving forward with implementation of the FIT program on Oahu as soon as possible, and will do so in accordance with a Commission decision and order in this docket." Letter from D. Endo-Omoto to Commission dated Feb. 26, 2010 ("February 26, 2010 Letter") at 3. For the same reasons, the Commission should issue its order adopting a tariff for Tier 3 of the FIT upon completion of the procedural steps related to that tariff and direct HECO to implement the FIT immediately and without delay. The final step regarding Tier 3 (other than a Commission decision) is to be completed May 13, 2010.

determine the capacity of the systems to accommodate energy from variable energy resources (“capacity determination”), whichever occurs first. During Phase 2, FIT projects for each company would be limited to either the D&O FIT cap or to the capacity determination.

Blue Planet’s analysis of the HECO RS Report, as set forth in these Comments, raises serious questions about whether and to what extent the report provides a basis for halting phased implementation of the FIT at this time. Although it states that no moratorium is called for, the HECO RS Report proposes that the “timing and implementation” of the FIT on the HELCO and MECO systems be postponed until they can be reviewed by the HECO Companies’ proposed Reliability Standards Working Group – a delay of at least six months to more than a year. Blue Planet’s analysis demonstrates that many of the conclusions of the HECO RS Report do not withstand scrutiny. In particular, the report does not appear to establish that phased implementation of the FIT on the HELCO and MECO systems will markedly increase curtailment or substantially compromise reliability. Because the HECO RS Report does not provide a sufficient basis for halting full or phased implementation of the FIT at this time, Blue Planet respectfully requests the Commission direct the HECO Companies to implement the FIT fully on the HECO system and in phases on the HELCO and MECO systems without delay.³

³ Phased implementation is consistent with the timing of the FIT contemplated by the Energy Agreement and procedural orders in this proceeding. The Energy Agreement parties request the Commission to conclude an investigative proceeding to determine the best design of a FIT by March 2009 and adopt tariffs and prices by July 2009. Energy Agreement at 17. Accordingly, the Commission’s October 28, 2008 Order Initiating Investigation directed the parties to submit to the Commission a stipulated procedural schedule that should, to the extent possible, allow the Commission to complete its deliberations and issue a decision by March 31, 2009. *Id.* at 7, 9. On January 20, 2009, the Commission issued its Order Approving the HECO Companies’ Proposed Procedural Order, As Modified, which adopts a schedule with July 17, 2009 as the due date for the final identified procedural step. And on October 29, 2009, the Commission issued its Order Setting Schedule setting forth the current schedule with May 13, 2010 as the due date for the final procedural step. Thus, further delays are contrary to the FIT timeframe envisioned by the Energy Agreement and the Commission’s procedural orders to date.

II. PHASED IMPLEMENTATION IS EXPECTED TO ADD RELATIVELY MODEST AMOUNTS OF PRIMARILY SOLAR PHOTOVOLTAIC ENERGY TO THE HELCO AND MECO SYSTEMS.

For purposes of these Comments, it is assumed that phased implementation will add relatively modest amounts of primarily solar PV energy to the HELCO and MECO systems. The D&O establishes the FIT for solar PV, concentrating solar power, onshore wind, and in-line hydro technologies. D&O at 31-32. Solar PV projects are expected to be the primary type of FIT project because in 2008 and 2009 energy from solar PV projects comprised 97% of the distributed generation (“DG”) energy added to the HECO, HELCO and MECO systems. Declaration of Michael E. Champley dated March 23, 2010 (“Dec. of M. Champley”) at para. 5.

Table 1: *Distributed Generation Additions to HECO, HELCO and MECO Systems, 2008-09 (MW)*

<i>Technology</i>	<i>HECO</i>	<i>HELCO</i>	<i>MECO</i>
Solar PV	10.40	4.10	3.60
Wind	0.00	0.07	0.01
CHP	0.00	0.00	0.50
TOTAL	10.40 MW	4.17 MW	4.11 MW

Dec. of M. Champley at para. 4; HECO Response to Blue Planet/HECO-IR-29 filed Mar. 1, 2010 at 2; *see also* HECO RS Report, Exhibit 1 at 6 (for the HELCO system “much of the new generation is or will be coming from variable photovoltaic (‘PV’) sources”).

Phase 1 and Phase 2 of the proposed phased implementation of the FIT are individually and collectively expected to add relatively modest amounts of this solar PV energy to the HELCO and MECO systems. As mentioned above, during Phase 1 FIT projects for each company should be limited to (i) project sizes established under Tiers 1 and 2 of the FIT, and (ii) nameplate capacity equal to 2.5% of the 2008 system peak demand. For purposes of these

Comments, it is assumed that during Phase 1 the FIT is fully subscribed and that FIT projects add 2.5% of the D&O FIT cap amount, or 5 MW, of solar PV energy to the HELCO and MECO systems.

Similarly, Phase 2 is proposed to commence upon the conclusion of the first twelve months of the FIT, or upon Commission approval of formal reliability standards and use of the standards to determine variable energy resources ("VERs")⁴ capacity, whichever occurs first. Accordingly, during Phase 2, amounts of energy from VERs projects would be limited to the D&O FIT cap amount or the capacity determination. As the VERs capacity is unknown at this time, for purposes of these Comments it is assumed that additions of VERs energy from Phase 2 projects are equivalent to 2.5% of the D&O FIT cap, or 5 MW.

It should be emphasized that phased implementation is proposed to address potential reliability concerns in two ways. First, Phase 1 is limited to 2.5% of the D&O FIT cap, thereby preventing the addition of up to 10 MW from solar PV FIT projects in the first year of the FIT program. Second, the capacity determination, anticipated approximately one year from inception of the FIT, may call for less than 5 MW (i.e., 2.5% of the FIT D&O cap) to be added during Phase 2.

III. THE HECO COMPANIES PROPOSE TO HALT IMPLEMENTATION OF THE FIT ON THE HELCO AND MECO SYSTEMS FOR SIX MONTHS TO A YEAR OR LONGER.

For purposes of these Comments, it is assumed that the HECO Companies have essentially requested the Commission to halt full or phased implementation of the FIT on the HELCO and MECO systems for at least six months and likely a year or longer. The HECO

⁴ See Federal Energy Regulatory Comm'n., Integration of Variable Energy Resources (Docket No. RM10-11-000), Notice of Inquiry dated Jan. 21, 2010, 130 FERC ¶ 61,053 at 1, n. 1 ("the term variable energy resource (VER) refers to renewable energy resources that are characterized by variability in the fuel source that is beyond the control of the resource operator. This includes wind and solar generation facilities and certain hydroelectric resources.").

Companies state that “no moratoriums are being called for” and that they will “continue to interconnect renewable DG [distributed generation] on each of the islands.” Letter from D. Endo-Omoto (HECO) to Commission dated Feb. 26, 2010 at 5. The HECO Companies also propose, however, that “timing of implementing the FIT” on the HELCO and MECO systems “should be subject to review by the proposed Working Group.”⁵ *Id.* at 3, 5. The HECO Companies’ proposed schedule for the Working Group proposes three “interim reports” and a “final report.” *Id.*, Attachment 1 at 7. The first interim report is due September 30, 2010 and the final report is due June 30, 2011. *Id.* Thus, even assuming the Commission adopts the HECO Companies’ proposed Working Group and report schedule, the Working Group proceeds without delay, one of the interim reports recommends implementation of the FIT on the HELCO and MECO systems, and the Commission promptly adopts the recommendation, the HECO Companies propose delaying implementation of the FIT a minimum of six months and up to one full year or longer.⁶

IV. THE D&O REQUIREMENT THAT FIT PROJECTS MUST “MARKEDLY” INCREASE CURTAILMENT AND “SUBSTANTIALLY” COMPROMISE RELIABILITY IS SUPPORTED BY THE PURPOSE OF THE FIT AND ENERGY POLICY.

Under the D&O, the HECO Companies must refuse to interconnect only projects that will “markedly” increase curtailment or “meaningfully” displace existing renewable energy.

⁵ Despite the relatively discrete nature of a Commission decision on phased implementation of the FIT for HELCO and MECO, the HECO Companies have proposed to dramatically expand the scope of this docket and extend it for another full year by establishing a “Working Group” and “Technical Support Group” to examine “reliability standards” and “commercial business concerns.” The Working Group is proposed to commence April 2010 and conclude in June 2011. *See, e.g.*, February 26, 2010, Attachment 1 “Proposed Conceptual Framework for Reliability Standards Working Group.” Blue Planet’s Comments on the Working Group filed March 15, 2010 oppose the Working Group in favor of immediate full implementation of the FIT on the HECO system and phased implementation on the HELCO and MECO systems, coupled with an independent new proceeding open to all stakeholders to develop formal reliability standards and VERs capacity determinations for all procurement mechanisms in a one-year period commencing as soon as possible.

⁶ The HECO Companies’ February 26, 2010 letter similarly proposes that the Working Group should “evaluate” moving Net Energy Metering (“NEM”) program caps to 4% of peak system load, and that for bi-lateral purchase power agreements on the HELCO and MECO systems no determinations on “performance requirements, curtailment, or contracting priority” will be made prior to the establishment of “reliability standards.” *Id.* at 3-4.

D&O at 50-51 (emphasis added). Stated otherwise, if FIT projects do not “markedly” increase curtailment or “meaningfully” displace existing renewable generation, then the HECO Companies must interconnect them if they are otherwise eligible for the FIT. Projects having a modest or insubstantial impact on curtailment must be interconnected.

Similarly, under the D&O, the HECO Companies must refuse to interconnect only those projects that “substantially compromise reliability[.]” D&O at 44 (emphasis added). Stated otherwise, if FIT projects do not “substantially” compromise reliability, the HECO Companies must interconnect them. The Compact Oxford English Dictionary defines “substantially” as “to a great or significant extent” and “for the most part; essentially.” *Id.* Using this dictionary definition for guidance, the HECO Companies may not refuse to interconnect FIT projects simply because they may compromise reliability. Rather, any FIT project impacts must affect system reliability to a great or significant extent. They must cause reliability impacts “for the most part” and “essentially” – not simply as a relatively minor contributing factor. Otherwise, such FIT projects must be interconnected.

This important language of the D&O is consistent with and follows from the purpose of the FIT and Hawaii energy policy. As Blue Planet has explained in prior filings with the Commission, the purpose of the FIT is not simply to provide another renewable energy procurement mechanism. As the Commission has noted, the FIT is needed in part to remedy the ongoing failure of existing mechanisms to procure sufficient amounts of renewable energy. *See, e.g.,* D&O at 13 (“a FIT is needed for the following reasons: . . . ‘only 4% of HECO’s sales (Oahu) were supplied by renewable energy, and 96% were supplied by imported fossil fuels.’”). Existing procurement methods have failed to timely achieve Hawaii’s clean energy objectives.

See, e.g., Energy Agreement⁷ at 1 (“the future of Hawaii requires” that Hawaii move “more decisively and irreversibly” towards renewable energy).

Rather, the purpose of the FIT is to dramatically accelerate renewable energy use in Hawaii. The second sentence of the D&O declares that FITs are approved to “accelerate the acquisition of renewable energy.” *Id.* at 1 (emphasis added). The D&O further cites to the Commission’s October 24, 2008 Order Initiating Investigation, which likewise affirms:

[The Energy] Agreement is a commitment on the part of the State and the HECO Companies to accelerate the addition of new, clean resources on all islands[.] . . . Included in the Agreement is a commitment by the HECO Companies to implement feed-in tariffs “to dramatically accelerate the addition of renewable energy from new sources” and to “encourage increased development of alternative energy projects.”

D&O at 2-3 (emphasis added) (citations omitted); *see also id.* at 5 (Statement of Issues includes best design for FITs to “accelerate and increase the development of Hawaii’s renewable energy resources[.]”); *id.* at 14 (according to the parties, a FIT will encourage “accelerated acquisition of renewable energy”); *id.* at 15 (FIT may “accelerate the acquisition of renewable energy”); *id.* at 42-43 (Commission’s desire to “accelerate the adoption of renewable energy” outweighs HECO Companies’ project size concerns). Consistent with the foregoing, the Commission has summarized the general purpose of the FIT and rationale for adopting the FIT as follows:

Given Hawaii’s overdependence on imported fossil fuels for its current electric generation, and the clear benefits a FIT can provide, the commission finds that a FIT should be adopted in Hawaii. There is no other state in the nation that is as dependent on oil as Hawaii is. That oil, which is the primary source of our electric generation, is imported into our State and comes from countries that may not be sympathetic to U.S. interests. A procurement mechanism, such as a FIT, may accelerate the acquisition of renewable energy onto the HECO Companies’

⁷ “Energy Agreement Among the State of Hawaii, Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs, and the Hawaiian Electric Companies” dated Oct. 20, 2008 (“Energy Agreement”).

systems thereby reducing our State's overall dependence on foreign oil; and produce some certainty as to all the price of electricity will no longer be as heavily tied to volatile oil prices. A process that is predictable in setting forth the essential terms under which renewable energy will be purchased by the utilities will, as SA and HSEA assert, reduce "the risk, and hence the cost, of non-utility generated power" and provide economic growth through "green collar" jobs and reduced export of dollars earned to purchase fossil fuels.

D&O at 15-16 (emphasis added). Accordingly, the D&O authorizes the HECO Companies to refuse to interconnect only those FIT projects that "markedly" increase curtailment or "substantially" compromise reliability.

The HECO Companies propose curtailment and system frequency as "initial measures" concerning reliability, stating that:

For purposes of quantifying reliability on the island grid systems, steady-state excess energy (curtailment) impacts and dynamic system frequency issues are proposed as initial measures to establish existing system baselines and to quantify the impact of increasing renewables on the systems.

HECO RS Report, Exhibit 1 at 9 (emphasis added). As explained below, the HECO RS Report fails to demonstrate that phased implementation is likely to "markedly" increase curtailment or "substantially" compromise reliability. Immediate phased implementation of the FIT on the HELCO and MECO systems is therefore necessary and appropriate.

V. PHASED IMPLEMENTATION IS UNLIKELY TO MARKEDLY INCREASE CURTAILMENT.

The HECO RS Report fails to establish that phased implementation of the FIT on the HELCO and MECO systems is likely to markedly increase curtailment or meaningfully displace existing renewable generation on those systems. Curtailment therefore does not appear to provide a basis for rejecting phased implementation.

First, the addition of up to 5 MW during Phase 1 and up to 5 MW during Phase 2 will not “markedly” increase curtailment because solar PV systems produce energy only during the day and thus are inherently unable to create the night-time excess energy conditions which HELCO claims require curtailment. The HELCO system experiences excess energy conditions during night time off-peak periods. Solar PV projects operate only during day time on-peak time periods and do not operate during night time off-peak time periods. *See* HECO RS Report, Exhibit 1 at 20 (Excess energy condition “occurs routinely on the MECO system . . . primarily during the off-peak times of day.”); *id.* at 15 (“[M]ost DG is PV and therefore producing during the day peak.”); *see also* HELCO T-4, Testimony of Ross H. Sakuda, P.E. (Docket No. 2009-0164) at 37 (HELCO would most likely curtail the Pakini Nui wind farm first, rather than the Sopogy facility, because “Sopogy uses the sun as its energy source, its output will be during the daylight hours, i.e., during HELCO’s on-peak periods (7:00 am 9:00 pm) [and] the periods of excess energy will most likely occur during HELCO’s off-peak periods (9:00 pm to 7:00 am).”). Therefore, FIT solar PV systems do not by themselves create excess energy conditions and curtailment.

Table 2: HELCO System Actual Curtailment Hours, On-Peak Versus and Off-Peak

<i>Energy Resource</i>	<i>2008</i>		<i>2009</i>	
	<i>Off-Peak (Hours)</i>	<i>On-Peak (Hours)</i>	<i>Off-Peak (Hours)</i>	<i>On-Peak (Hours)</i>
Tawhiri	228	0	709	1
HRD	52	0	249	0
PGV	3	0	87	0
Wailuku Hydro	0	0	43	0
RANGE OF CURTAILMENT HOURS	0-228	0	43-709	0-1

Dec. of M. Champley at para. 4. “On Peak” is 7:00 AM to 9:00 PM and “off-peak” is 9:00 PM to 7:00 AM. *Id.* Hours figures in Table 2 for other than PGV represent all hours HELCO requested full or partial curtailment. *Id.* Hours figures for PGV represent all hours HELCO restricted output to contract minimum due to excess energy conditions. *Id.*; *see also* HECO Response to SA/HSEA-SIR-2, attached as Exhibit “A” to Declaration of Counsel (“Dec. of Counsel”).

Second, even assuming FIT solar PV systems may contribute to excess energy conditions on the HELCO system, any such contribution would be relatively small compared to the contribution of planned transmission-level renewable projects during the 2010-12 time period. HELCO plans to add up to 225,000 MW hours (“MWh”) annually to its system from transmission-level projects (based on an assumed 75% to 80% capacity factor). *See* HECO RS Report, Exhibit 1 at 15, 25. By contrast, the potential output of solar PV FIT projects for Phase 1 is approximately 7,500 MWh and for Phase 2 is up to approximately 7,500 MWh, for a total of approximately 15,000 MWh (based on the approximately 17% capacity factor employed by the HECO Companies concerning their proposed Tiers 1 and 2 Tariff) during phased implementation of the FIT. Dec. of M. Champley at para. 6. On an annual basis, the FIT solar PV projects will add only small fraction – approximately 1/30th – of the amount of energy added by planned transmission-level projects. The thirty-fold difference in magnitude underscores the conclusion that the addition of 5 MW during Phase 1 and up to 5 MW during Phase 2 will not, by themselves, “markedly” increase curtailment on the HELCO system.

Third, the HECO RS Report dramatically overstates the total number of hours HELCO curtailed variable generation in 2008-09. Figure 3 of Attachment 4 to the HECO RS Report is titled, “2009 Load Duration with Present Generation Mix.” *Id.* For illustrative

purposes, Figure 3 states that HELCO curtailed transmission-level renewable energy projects in the range of 2,227 to 3,135 hours in 2009. *See* HECO RS Report, Attachment 4 at 4, 12; HECO Response to SA/HSEA-SIR-2, attached as Exhibit “A” to Dec. of Counsel. This range is incorrect; the actual curtailment range for HELCO in 2009 is 43 to 710 hours.

Table 3: *Comparison of HELCO Curtailment Hours Estimate to Actual Curtailment Hours*

<i>Year</i>	<i>Estimated Curtailment (Hours)</i>	<i>Actual Curtailment Range by Project (Hours)</i>
2008	2,089 – 3,034	0-228
2009	2,227 – 3,135	43-710

Dec. of M. Champley at para. 4; HECO RS Report, Attachment 4 at 4, 12; HECO Response to SA/HSEA-SIR-2, attached as Exhibit “A” to Dec. of Counsel. Because the range of curtailment hours is central to the HECO Companies’ conclusion that FIT projects will negatively impact reliability, this dramatic overstatement raises serious questions about the report’s methodologies and conclusions concerning curtailment.

Fourth, the HECO RS Report’s reliance on load duration curves may also be questioned. The report uses comparisons of 2008 and 2009 load duration curves to attempt to demonstrate that solar PV generation caused excess energy conditions and curtailment. *See, e.g.*, HECO RS Report at 12-15. As explained above, and as shown in Table 2, however, HELCO curtailed renewable energy producers in 2008 and 2009 only during off-peak periods and therefore solar PV generation did not contribute to excess energy conditions or cause curtailment. In addition, load duration curves may vary from year to year due to causes other than solar PV generation, including weather conditions and reduced electricity consumption due to energy efficiency measures, conservation efforts, and reduced economic activity. Thus,

comparisons of load duration curves do not provide a sound basis for concluding that phased implementation of the FIT will “markedly” increase curtailment on the HELCO system. Dec. of M. Champley at para. 7.

Fifth, the HECO Companies admit that the actual studies relied upon in the HECO RS Report to support arguments concerning excess energy and curtailment “do not include any planned distribution system level renewable energy projects nor do they include renewable energy from the addition of FIT Tiers 1 and 2 projects equal to 5% of MECO and HELCO 2008 system peak load.” See HECO Response to Blue Planet/HECO-IR-24 (emphasis added). Thus, the HECO RS Report draws conclusions about the potential impacts of additions to the HELCO system from Phase 1 and Phase 2 based in part on studies which excluded these very additions.

Finally, in its rate case, HELCO employed a relatively complex and thorough production simulation modeling methodology to analyze and assess curtailment and “dumped energy.” See HELCO T-4, Testimony of Ross H. Sakuda, P.E. (Docket No. 2009-0064) at 37. Despite the Commission’s issuance of PUC-IR-1 over one year ago, and the critical importance of timely determining the capacity of the HECO Companies’ systems to accommodate variable generation from the FIT, the HECO RS Report does not appear to utilize an equivalent methodology with regard to the curtailment. This is particularly concerning insofar as the HECO RS Report’s main conclusion, that there “minimal to no room” on the MECO and HELCO systems, according to the HECO Companies “is due primarily to curtailment concerns although absent ability to appropriately curtail resources to maintain system balances, broader system reliability concerns must be addressed.” HECO RS Report, Exhibit 1 at 4; HECO Response to Blue Planet/HECO-IR-10(b) (emphasis added).

In summary, phased implementation is unlikely to “markedly” increase curtailment because excess energy conditions currently occur at night when solar PV projects do not operate, new transmission-level projects are expected to be the primary future causes of excess energy conditions, and the report’s methodologies and conclusions – including dramatically overstating curtailment hours – may be called into question. Curtailment therefore does not provide a sound basis for rejecting phased implementation of the FIT.

VI. PHASED IMPLEMENTATION IS UNLIKELY TO SUBSTANTIALLY COMPROMISE RELIABILITY.

The HECO RS Report also fails to establish that phased implementation will negatively impact system reliability, in terms of dynamic system stability during system disturbances and steady-state system frequency variability. Reliability concerns therefore do not appear to provide a basis for halting phased implementation of the FIT on the HELCO and MECO systems.

A. Phased Implementation Is Unlikely to Cause Steady-State System Frequency Variability.

Although the HECO RS Report’s discussion of frequency control sometimes conflates wind and solar PV energy sources, wind projects – rather than solar PV projects – create frequency control challenges. Indeed, the report acknowledges that wind is a primary driver of frequency concerns:

The variable output from wind generation on the HELCO system had a profound and measurable effect on frequency control. HELCO has taken many actions to mitigate the impacts of the variable wind on frequency control, including modification of the AGC program and parameters, changes to reserve policies, and changes to governor droop settings and equipment. Even with these actions, variable wind is the largest driver for frequency error on the HELCO system.

Id., Attachment 3 at 16; *see also id.* at 12 (“The statistical analysis confirmed that wind fluctuations are the predominant driver of frequency error on the HELCO system, particularly when wind plants are at the mid-range of the power curve.”). Wind projects create frequency control issues during early morning and late evening load ramping periods. HECO RS Report, Attachment 3 at 12. The output from Phase 1 and Phase 2 solar PV projects would occur outside these load ramping periods. In addition, aggregate solar PV output will decline as the number of geographically-dispersed PV systems increase. Thus, potential solar PV output variability would not create operational challenges during these time periods and any contribution of Phase 1 and 2 solar PV FIT projects to frequency concerns would be relatively minor as compared to frequency concerns caused by wind projects. Dec. of M. Champley at para. 8.

In addition, a relatively basic analysis, based on the addition of 5 MW during Phase 1, casts doubt on the HECO Companies’ assertions that FIT projects may harm system frequency. As explained in its response to HECO/Blue Planet-IR-10 filed March 1, 2010, Blue Planet has concluded that potential instantaneous system frequency fluctuations attributable only to FIT projects, added to the HELCO system in an amount up to 2.5% of the 2008 system peak demand, are expected to be within the bounds of normal system frequency control ranges for the HELCO system, as set forth in Table 8 of the HECO RS Report, “System Operating Criteria.” The analysis assumes solar PV inverters for the projects have expanded frequency and voltage ride-through capabilities to ensure that system disturbances would not be exacerbated by the potential “drop-out” of solar PV electrical output due to a decline in system frequency. It also assumes that meteorological conditions are not capable of producing a substantial instantaneous reduction in electric output from all solar PV inverters installed across an entire island during periods of peak solar PV output.

The analysis concludes that potential instantaneous frequency fluctuations from FIT projects are expected to be within the bounds of normal system frequency control ranges for the HELCO system. The addition of 5 MW to the HELCO system would create a maximum instantaneous frequency fluctuation of approximately ± 0.05 Hertz ("Hz") (5 MW x 25% potential immediate electrical output drop-off due to cloud cover \div 2.5 MW/0.1Hz HELCO system frequency bias equals ± 0.05 Hz potential frequency fluctuation). The maximum potential frequency fluctuations due to solar PV projects would be expected to occur only during the limited hours of peak solar PV electrical output (i.e., 11:00 AM to 2:00 PM). Such a potential maximum frequency fluctuation would require a combined generator ramp rate of less than 2 MW per minute to mitigate potential frequency fluctuations. It is reasonable to assume that HELCO could use generator primary frequency response (generator governor droop response) and, if necessary, regulation reserves, to provide this response rate. Dec. of M. Champley at para. 9. This conclusion is also supported by a comparison of the frequency impact of various generating resources due to "forced outages" including instantaneous renewable energy ramping events.

Table 5: *Frequency Impact Comparison of Generation "Forced Outages" on HELCO System*

<i>System Disturbance</i>	<i>Fossil Unit</i>	<i>Wind Project</i>	<i>Dispersed Solar PV</i>	
			<i>Current at 12/31/09</i>	<i>Current w/ Phase 1</i>
Generation Capacity (MW)	20	20	6.8	11.8
Forced Outage or Instantaneous Ramp Event	100%	75%	25%	25%
Generation Output Loss (MW)	20	15	2	3
System Frequency Change (Hertz)	-0.80	-0.60	-0.07	-0.12

Dec. of M. Champley at para. 4; *see also* HECO RS Report, Exhibit 1.

B. The HECO Companies and Solar Industry Are Effectively Addressing Concerns Regarding Dynamic System Stability.

The issue of dynamic stability during system disturbances does not provide a basis for halting phased implementation because the HECO Companies and solar PV industry participants have undertaken actions to address this concern. Specifically, they have agreed to establish solar PV system inverter trip points for new systems and pledged to modify existing solar PV systems trip points in a manner that satisfactorily addresses dynamic system stability concerns. The HECO RS Report acknowledges the HELCO's efforts in this regard. *See, e.g.*, HECO RS Report, Attachment 2 at 10 ("In order to allow more variable generation on the system, HELCO was successful in converting 2.4 MW of variable distributed generation from 59.3 hertz to 57.0 hertz reducing the aggregate variable generation with frequency set-points of 59.3 hertz from 6.8MW to 4.4MW.") Consistent with the foregoing, Blue Planet suggests the Commission direct the HECO Companies to establish appropriate solar PV inverter frequency set-point standards on their electric systems. The Commission should also direct HECO Companies to establish alternative voltage ride-through criteria for PV inverters (such as the voltage ride-through criteria for wind turbines) and require them for all new PV inverter installations. This may avoid the necessity of reprogramming future PV inverters. Dec. of M. Champley at para. 10.

C. Typical Service Interruptions Suggest Phased Implementation Does Not Substantially Compromise Reliability.

Any service interruptions experienced by HELCO and MECO customers due to FIT projects must be viewed in the context of typical service interruptions due to the companies' use of under frequency load shedding ("UFLS") and offline quick-start generation rather than spinning reserves. HELCO customers typically experience periodic, limited duration electric

service interruptions due to fossil generator equipment problems (unit trips) because UFLS (limited customer interruptions) and quick starting off-line back-up generators, not on-line generators, provide the equivalent of spinning reserves to mitigate system disturbances such as generator or transmission line trips. Dec. of M. Champley at para. 11. By contrast, Oahu relies upon on-line generator spinning reserves to provide uninterrupted continuity of electric service for all customers in the event that the largest on-line generator unit trips off-line. *Id.*

Table 6: HELCO Utilization of UFLS since January 1, 2008

	<i>Number of UFLS Events</i>				
<i>System Disturbance</i>	<i>2008</i>	<i>2009</i>	<i>Jan. 2010</i>	<i>Total</i>	<i>Percent</i>
Fossil Generator Trip	11	15	2	28	88%
Wind Farm Event	0	2	0	2	6%
Transmission Line Trip	0	2	0	2	6%
TOTAL	11	19	2	32	100%

Dec. of M. Champley at para. 4; HECO Response to Blue Planet/HECO-IR-15 filed Mar. 1, 2010. Viewed in this context, any service interruptions due to Phase 1 and Phase 2 FIT projects, do not appear likely to “substantially” compromise reliability.

The HECO RS Report also lacks data, trends, and statistical analyses based system reliability performance metrics. To establish negative reliability impacts, overall trends must be evaluated with regard to whether the trends demonstrate deteriorating conditions. Dec. of M. Champley at para. 12.

VII. CONCLUSION

For all of the foregoing reasons, Blue Planet respectfully requests the Commission to (i) upon approval of the tariffs direct the HECO Companies to immediately implement the FIT fully on the HECO system and in phases on the HELCO and MECO systems, (ii) conclude the

FIT docket in due course and without extending the docket for purposes of the proposed Working Group. and (iii) initiate an independent proceeding open to all stakeholders for the purpose of developing and adopting formal reliability standards and using those standards to determine the capacity of the HECO Companies systems to accept variable energy resources now and in the decades to come as Hawaii transitions to a clean energy economy.

DATED: Honolulu, Hawaii, March 23, 2010.



DOUGLAS A. CODIGA
Attorney for Blue Planet Foundation

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF HAWAII

In the Matter of

PUBLIC UTILITIES COMMISSION

Instituting a Proceeding to Investigate the
Implementation Of Feed-in Tariffs.

DOCKET NO. 2008-0273

DECLARATION OF MICHAEL E. CHAMPLEY

I, MICHAEL E. CHAMPLEY, declare and say:

1. I am the principal of Kahakuloa Energy Advisors LLC, an energy consulting firm which advises clients on strategic, regulatory policy and operational issues primarily related to electric resource planning.

2. I serve as a professional consultant to Intervenor Party Blue Planet Foundation ("Blue Planet") in the State of Hawaii Public Utilities Commission Docket No. 2008-0273 concerning implementation of feed-in tariffs ("FIT").

3. This declaration is based upon my personal knowledge and, where stated, upon my reasonable belief and information and I am competent to testify as to the matters stated in this declaration.

4. My professional consulting services to Blue Planet in this proceeding include reviewing and analyzing technical data and information, and performing calculations and analyses, for purposes of Blue Planet Foundation's Comments ("Comments") on the Hawaiian Electric Company, Inc. ("HECO"), Hawaii Electric Light Company, Inc. ("HELCO"), and Maui Electric Company, Limited's ("MECO") (collectively, "HECO Companies") Reliability

Standards Report filed February 8, 2010 (“HECO RS Report”) filed March 23, 2010, including each of the six tables included in the Comments, denominated as Tables 1 through 6.

5. Solar photovoltaic (“PV”) projects are expected to be the primary type of FIT project because in 2008 and 2009 energy from solar PV projects comprised 97% of the distributed generation (“DG”) energy added to the HECO, HELCO and MECO systems.

6. The potential output of solar PV FIT projects for Phase 1 (as that term is described in the Comments) is approximately 7,500 MWh and for Phase 2 (as that term is described in the Comments) is up to approximately 7,500 MWh, for a total of approximately 15,000 MWh (based on the approximately 17% capacity factor employed by the HECO Companies in their proposed Tiers 1 and 2 Tariff) during phased implementation of the FIT.

7. Load duration curves may vary due to causes other than variable generation, including weather conditions and reduced electricity consumption due to energy efficiency measures, conservation efforts, and reduced economic activity. Comparisons of load duration curves do not provide a sound basis for concluding that phased implementation of the FIT will markedly increase curtailment on the HELCO system.

8. The output from Phase 1 and Phase 2 solar PV projects would occur outside of the early morning and late evening load ramping periods. Aggregate solar PV output will decline as the number of geographically-dispersed PV systems increase. Potential solar PV output variability would not create operational challenges during these time periods and any contribution of Phase 1 and 2 solar PV FIT projects to frequency concerns would be relatively minor as compared to frequency concerns caused by wind projects.

9. Potential instantaneous frequency fluctuations from FIT projects are expected to be within the bounds of normal system frequency control ranges for the HELCO

system. The addition of 5 MW to the HELCO system would create a maximum instantaneous frequency fluctuation of approximately ± 0.05 Hertz ("Hz") ($5 \text{ MW} \times 25\%$ potential immediate electrical output drop-off due to cloud cover $\div 2.5 \text{ MW}/0.1 \text{ Hz}$ HELCO system frequency bias equals $\pm 0.05 \text{ Hz}$ potential frequency fluctuation). The maximum potential frequency fluctuations due to solar PV projects would be expected to occur only during the limited hours of peak solar PV electrical output (i.e., 11:00 AM to 2:00 PM). Such a potential maximum frequency fluctuation would require a combined generator ramp rate of less than 2 MW per minute to mitigate potential frequency fluctuations. It is reasonable to assume that HELCO could use generator primary frequency response (generator governor droop response) and, if necessary, regulation reserves, to provide this response rate.

10. The Commission should direct the HECO Companies to establish appropriate solar PV inverter frequency set-point standards on their electric systems. The Commission should also direct HECO Companies to establish alternative voltage ride-through criteria for PV inverters (such as the voltage ride-through criteria for wind turbines) and require them for all new PV inverter installations. This may avoid the necessity of reprogramming future PV inverters.

11. HELCO customers typically experience periodic, limited duration electric service interruptions due to fossil generator equipment problems (unit trips) because Hawaii Island and Maui grids use under frequency load shedding ("UFLS") (limited customer interruptions) and quick starting off-line back-up generators, not on-line generators, to provide the equivalent of spinning reserves to mitigate system disturbances such as generator or transmission line trips. Oahu relies upon on-line generator spinning reserves to provide

uninterrupted continuity of electric service for all customers in the event that the largest on-line generator unit trips off-line.

12. The HECO RS Report lacks data, trends, and statistical analyses based system reliability performance metrics. To establish negative reliability impacts, overall trends must be evaluated with regard to whether the trends demonstrate deteriorating conditions.

I, MICHAEL E. CHAMPLEY, do declare under penalty of law that the foregoing is true and correct.

DATED: Haiku, Hawaii, March 23, 2010.


MICHAEL E. CHAMPLEY

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF HAWAII

In the Matter of

PUBLIC UTILITIES COMMISSION

Instituting a Proceeding to Investigate the
Implementation Of Feed-in Tariffs.

DOCKET NO. 2008-0273

DECLARATION OF COUNSEL

I, DOUGLAS A. CODIGA, declare and say:

1. I am an attorney with the law firm Schlack Ito Lockwood Piper & Elkind LLC, counsel for Blue Planet Foundation in this proceeding, and am licensed to practice law before the courts of the State of Hawaii. I am duly authorized to make this declaration based upon my personal knowledge.

2. Attached as Exhibit A is a true and correct copy of (i) the cover e-mail from Marisa Chun, HECO Companies, to the parties in the above-captioned matter dated March 1, 2010 concerning the HECO Companies' responses to the parties' supplemental information requests, (ii) the HECO Companies' response to SA/HSEA-SIR-2, and (iii) the accompanying spreadsheet to that response from the file labeled "sa_hsea_sir_2 HELCO EXCESS ENERGY."

3. The Declaration of Michael E. Champley is filed herein with facsimile signature page and the original executed signature page will be filed with the Commission upon receipt by counsel.

I, DOUGLAS A. CODIGA, do declare under penalty of law that the foregoing is true and correct.

DATED: Honolulu, Hawaii, March 23, 2010.



DOUGLAS A. CODIGA

Kelly Camp

From: Chun, Marisa [marisa.chun@heco.com]
Sent: Thursday, March 11, 2010 5:35 PM
To: Brown, Dan; Carl Freedman (Haiku Design & Analysis); Caroline Belsom (MLP); Carrie Hitt (Solar Alliance); Chris Mentzel (Clean ENergy Maui); Chun, Marisa; Clifford Smith (Maui Land & Pineapple); David Henkin (HSEA earthjustice); Dean Nishina (CA); Douglas Codiga; Erik Kvam (Zero Emissions); Estrella Seese (DBEDT); Gerald Sumida (First Wind); Gordon Nelson (City & County); Gregg Kinkley (DBEDT); Harlan Kimura (Tawhiri Power); Henry Curtis (LOL); Isaac Moriwake (HSEA earthjustice); Jody Allione (HREA); Joel Matsunaga (Hawaii BioEnergy); Jon Ishikawa (Sopogy); Kat Brady (LOL); Katsura, Kevin; Kent D. Morihara; Kikuta, Peter Y. @Goodsill; Kris N. Nakagawa; lane.h.tsuchiyama@dcca.hawaii.gov; Mark Duda (HSEA); Matsuura, Dean; Michael Udovic (County of Hawaii); Mike Champley (HDA); Mike Gresham (First Wind); Motoki, Rosella; Nathan Nelson (First Wind); Pamela Joe (Sopogy); Riley Saito (Solar Alliance); Rod Aoki ; Sandra Wilhide; sandra wong; Seu, Scott; Ted Peck (DBEDT); Ted Roberts (Sempra Generation); Tim Lui-Kwan (First Wind; Warren Bollmeier (HREA); William Brilhante (County of Hawaii)
Subject: Dkt 2008-0273: Informal Responses to Parties Supplemental Information Requests
Attachments: HECO Response to Blue Planet-HECO-IRs 36 through 39.pdf; HECO Response to DBEDT-HECO-SIRs 1 through 5.pdf; Dkt 2008-0273 DBEDT-HECO-SIR-5 Lanai SysLoad_2008-2009.xls; HECO Response to SA-HSEA-SIRs 1 through 8.pdf; Dkt 2008-0273 SA-HSEA-SIR 2 parts a and b - MECO.xls; sa_hsea_sir_2 helco excess energy curtailments.xls

Parties,

Attached are the HECO Companies responses to Blue Planet, DBEDT, and SA/HSEA's informal supplemental requests. Please note that there are a few SIR responses which we were not able to finish by today and therefore will provide a response shortly. In addition, if you require clarification on any of the HECO Companies' responses, please feel free to call/email me.

Thank you,
 Marisa

Marisa Chun
 Regulatory Affairs
 Hawaiian Electric Company
 P.O. Box 2750
 Honolulu, Hawaii 96840-0001
 Phone: (808) 543-4723

CONFIDENTIALITY NOTICE: This e-mail message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and/or privileged information. Any unauthorized review, use, copying, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender immediately by reply e-mail and destroy the original message and all copies.

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EXHIBIT A ¹

3/23/2010

SA/HSEA-SIR-2

- a. In regards to your response to BP-IR-18 and other similar requests, please provide, for HECO, HELCO and MECO, the actual and/or estimated total amount of time of curtailment because of excess energy (in hours, or whatever unit by which this is measured), by month and by on-peak (day) and off-peak (night) periods, for the period of January 1, 2008 to the present.
- b. Please provide the data described above with respect to each renewable energy facility that was curtailed because of excess energy during the period of January 1, 2008 to the present.
- c. Please provide any and all reports or other documents by which the HECO Companies record curtailment based on excess energy.

HECO Companies Response:

- a. For HELCO, the record of curtailments are manually compiled by the contracts administrator from a combination of the system activity logs generated by the SCADA/EMS system and the manually entered operator log-books which are maintained for each independent power producer. These manually compiled reports indicate the time at which each facility was curtailed for excess energy and the time the curtailment was subsequently lifted. The information for excess energy curtailments on the HELCO system is provided in file "sa_hsea_sir_2 HELCO EXCESS ENERGY CURTAILMENTS" The duration of the curtailment is indicated. The curtailments are not broken down into on-peak and off-peak periods, but the actual times of curtailment are indicated. Tawhiri (Apollo) which is the first to be curtailed for excess energy did have a limited number of curtailments past seven o'clock in the morning, which is the designated start of "on-peak" periods. Resources not identified within this file were not subject to excess energy curtailments in the years requested. Similarly, MECO's response provided in file "Dkt 2008-0273 SA-HSEA-SIR 2 parts a and b – MECO" is compiled from manually entered operator's logs. The curtailment logs in both HELCO and MECO cases indicate periods where the output of each facility has been limited by the system

operator to avoid over generation on the system. Because of the variable nature of wind and the granularity at which the operators record readings, the data should be considered an *estimate* of the hours where the facility was operating at reduced output due to excess energy curtailments. For example, a wind farm that is curtailed to 15 MW may only be able to produce 8 MW when the winds dies down. Technically, once the wind farm's output is less than the curtailment level (15 MW in this case), the amount of energy being purchased from the facility is not being "curtailed" by the utility. Complexities like this may or may not have been captured in the manually recorded data, as the primary purpose for these logs is not to simply capture such events. On Oahu, we currently do not have the level of wind or solar projects and do not have curtailment information.

- b. Please see response to subpart (a) above.
- c. As noted in subparts a and b, curtailment data due to excess energy is manually compiled from a variety of system activity logs (including those generated by SCADA and EMS) and provides only an estimate of the hours that the resources were curtailed as opposed to the energy that is curtailed. As many of the log files and system reports may contain competitive project performance (of wind projects versus solar projects) and sensitive generation and grid information, extracting the voluminous logs and datafiles may not be the most prudent path to address the curtailment assessment needs. The Hawaiian Electric Companies are willing to work with the parties to tailor the specific data needs. Depending on the analysis, we can work to define the data needs, identify if the data is available and appropriately extract the granularity of data as needed (e.g., daily, monthly, annually).

Hawi Renewable Development - Excess Energy Curtailment 2008 to 2009

HELCO Curtailed Alarm	HELCO Curtailed Normal	d:h:mm
1 Wed, Jan 30, 2008 00:27	Wed, Jan 30, 2008 04:41	0:4:14
2 Tue, Feb 05, 2008 02:20	Tue, Feb 05, 2008 04:10	0:1:50
3 Wed, Feb 06, 2008 02:00	Wed, Feb 06, 2008 04:00	0:2:00
4 Thu, Feb 07, 2008 02:32	Thu, Feb 07, 2008 03:59	0:1:27
5 Sat, Feb 09, 2008 02:53	Sat, Feb 09, 2008 04:22	0:1:29
6 Sun, Feb 10, 2008 01:12	Sun, Feb 10, 2008 04:27	0:3:15
7 Mon, Feb 11, 2008 03:00	Mon, Feb 11, 2008 04:09	0:1:09
8 Tue, Feb 12, 2008 03:23	Tue, Feb 12, 2008 03:55	0:0:32
9 Mon, May 05, 2008 02:54	Mon, May 05, 2008 03:10	0:0:16
10 Fri, May 09, 2008 01:19	Fri, May 09, 2008 04:01	0:2:42
11 Sat, May 10, 2008 01:45	Sat, May 10, 2008 04:04	0:2:19
12 Sun, May 11, 2008 01:30	Sun, May 11, 2008 04:54	0:3:24
13 Mon, May 12, 2008 00:40	Mon, May 12, 2008 04:18	0:3:38
14 Fri, Aug 29, 2008 02:32	Fri, Aug 29, 2008 04:08	0:1:36
15 Thu, Nov 27, 2008 01:05	Thu, Nov 27, 2008 05:01	0:3:56
16 Fri, Dec 26, 2008 00:29	Fri, Dec 26, 2008 04:14	0:3:45
17 Sat, Dec 27, 2008 00:40	Sat, Dec 27, 2008 05:11	0:4:31
18 Sun, Dec 28, 2008 00:44	Sun, Dec 28, 2008 04:58	0:4:14
19 Mon, Dec 29, 2008 00:49	Mon, Dec 29, 2008 04:22	0:3:33
20 Tue, Dec 30, 2008 01:28	Tue, Dec 30, 2008 04:13	0:2:45
21 Sat, Jan 03, 2009 01:04	Sat, Jan 03, 2009 06:05	0:5:01
22 Sun, Jan 04, 2009 00:44	Sun, Jan 04, 2009 05:07	0:4:23
23 Mon, Jan 05, 2009 00:29	Mon, Jan 05, 2009 04:44	0:4:15
24 Wed, Jan 07, 2009 03:56	Wed, Jan 07, 2009 04:20	0:0:24
25 Thu, Jan 08, 2009 00:48	Thu, Jan 08, 2009 04:48	0:4:00
26 Fri, Jan 23, 2009 02:30	Fri, Jan 23, 2009 03:57	0:1:27
27 Sat, Jan 24, 2009 01:39	Sat, Jan 24, 2009 04:07	0:2:28
28 Wed, Feb 04, 2009 00:30	Wed, Feb 04, 2009 04:51	0:4:21
29 Thu, Feb 05, 2009 01:00	Thu, Feb 05, 2009 01:29	0:0:29
30 Wed, Feb 11, 2009 00:33	Wed, Feb 11, 2009 04:04	0:3:31
31 Thu, Feb 12, 2009 01:07	Thu, Feb 12, 2009 05:10	0:4:03
32 Thu, Feb 12, 2009 23:45	Fri, Feb 13, 2009 05:20	0:5:35
33 Sat, Feb 14, 2009 01:00	Sat, Feb 14, 2009 05:03	0:4:03
34 Sat, Feb 14, 2009 23:47	Sun, Feb 15, 2009 05:56	0:6:09
35 Mon, Feb 16, 2009 00:10	Mon, Feb 16, 2009 05:20	0:5:10
36 Tue, Feb 17, 2009 00:48	Tue, Feb 17, 2009 04:48	0:4:00
37 Wed, Feb 18, 2009 00:53	Wed, Feb 18, 2009 03:38	0:2:45
38 Thu, Feb 19, 2009 01:53	Thu, Feb 19, 2009 04:15	0:2:22
39 Fri, Feb 20, 2009 01:24	Fri, Feb 20, 2009 04:30	0:3:06
40 Sun, Mar 01, 2009 01:32	Sun, Mar 01, 2009 04:37	0:3:05
41 Mon, Mar 02, 2009 01:09	Mon, Mar 02, 2009 03:29	0:2:20
42 Tue, Mar 03, 2009 01:34	Tue, Mar 03, 2009 03:06	0:1:32
43 Wed, Mar 04, 2009 01:45	Wed, Mar 04, 2009 04:07	0:2:22
44 Thu, Mar 05, 2009 01:46	Thu, Mar 05, 2009 04:27	0:2:41
45 Fri, Mar 06, 2009 00:47	Fri, Mar 06, 2009 04:20	0:3:33
46 Sat, Mar 07, 2009 01:06	Sat, Mar 07, 2009 05:10	0:4:04
47 Sun, Mar 08, 2009 01:03	Sun, Mar 08, 2009 05:01	0:3:58
48 Mon, Mar 09, 2009 00:14	Mon, Mar 09, 2009 04:29	0:4:15
49 Tue, Mar 10, 2009 01:52	Tue, Mar 10, 2009 04:05	0:2:13

50 Sat, Mar 21, 2009 01:27	Sat, Mar 21, 2009 05:12	0:3:45
51 Sun, Mar 22, 2009 00:51	Sun, Mar 22, 2009 04:46	0:3:55
52 Mon, Mar 23, 2009 00:17	Mon, Mar 23, 2009 05:00	0:4:43
53 Tue, Mar 24, 2009 00:45	Tue, Mar 24, 2009 04:49	0:4:04
54 Wed, Mar 25, 2009 00:30	Wed, Mar 25, 2009 04:58	0:4:28
55 Thu, Mar 26, 2009 00:20	Thu, Mar 26, 2009 04:47	0:4:27
56 Fri, Mar 27, 2009 00:34	Fri, Mar 27, 2009 04:53	0:4:19
57 Sat, Mar 28, 2009 01:06	Sat, Mar 28, 2009 05:01	0:3:55
58 Sun, Mar 29, 2009 00:29	Sun, Mar 29, 2009 05:21	0:4:52
59 Mon, Mar 30, 2009 01:08	Mon, Mar 30, 2009 04:28	0:3:20
60 Tue, Mar 31, 2009 02:22	Tue, Mar 31, 2009 04:06	0:1:44
61 Wed, Apr 01, 2009 01:30	Wed, Apr 01, 2009 04:17	0:2:47
62 Thu, Apr 02, 2009 02:05	Thu, Apr 02, 2009 04:13	0:2:08
63 Fri, Apr 03, 2009 02:11	Fri, Apr 03, 2009 03:06	0:0:55
64 Sat, Apr 04, 2009 01:43	Sat, Apr 04, 2009 04:47	0:3:04
65 Mon, Apr 13, 2009 01:24	Mon, Apr 13, 2009 04:05	0:2:41
66 Mon, Oct 26, 2009 01:53	Mon, Oct 26, 2009 04:05	0:2:12
67 Sun, Nov 01, 2009 01:36	Sun, Nov 01, 2009 03:47	0:2:11
68 Fri, Nov 06, 2009 02:38	Fri, Nov 06, 2009 04:48	0:2:10
69 Mon, Nov 09, 2009 02:06	Mon, Nov 09, 2009 04:01	0:1:55
70 Fri, Nov 13, 2009 00:05	Fri, Nov 13, 2009 05:14	0:5:09
71 Sat, Nov 14, 2009 02:55	Sat, Nov 14, 2009 05:06	0:2:11
72 Sun, Nov 15, 2009 00:25	Sun, Nov 15, 2009 05:44	0:5:19
73 Mon, Nov 16, 2009 00:12	Mon, Nov 16, 2009 04:44	0:4:32
74 Mon, Nov 16, 2009 23:28	Tue, Nov 17, 2009 05:27	0:5:59
75 Wed, Nov 18, 2009 00:38	Wed, Nov 18, 2009 05:16	0:4:38
76 Wed, Nov 18, 2009 23:37	Thu, Nov 19, 2009 05:08	0:5:31
77 Fri, Nov 20, 2009 03:03	Fn, Nov 20, 2009 04:04	0:1:01
78 Fri, Nov 20, 2009 23:29	Sat, Nov 21, 2009 06:04	0:6:35
79 Sat, Nov 21, 2009 23:50	Sun, Nov 22, 2009 06:14	0:6:24
80 Tue, Nov 24, 2009 00:15	Tue, Nov 24, 2009 05:05	0:4:50
81 Wed, Nov 25, 2009 01:01	Wed, Nov 25, 2009 04:53	0:3:52
82 Wed, Nov 25, 2009 23:44	Thu, Nov 26, 2009 05:37	0:5:53
83 Thu, Nov 26, 2009 23:25	Fri, Nov 27, 2009 01:44	0:2:19
84 Sat, Nov 28, 2009 00:12	Sat, Nov 28, 2009 05:23	0:5:11
85 Sun, Nov 29, 2009 00:32	Sun, Nov 29, 2009 06:33	0:6:01
86 Tue, Dec 01, 2009 01:07	Tue, Dec 01, 2009 04:46	0:3:39
87 Fri, Dec 11, 2009 01:30	Fri, Dec 11, 2009 04:15	0:2:45
88 Sat, Dec 12, 2009 02:20	Sat, Dec 12, 2009 04:46	0:2:26
89 Sat, Dec 26, 2009 00:44	Sat, Dec 26, 2009 04:53	0:4:09

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF HAWAII

In the Matter of

DOCKET NO. 2008-0273

PUBLIC UTILITIES COMMISSION

Instituting a Proceeding to Investigate the
Implementation Of Feed-in Tariffs.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this date a copy of the foregoing document was
duly served upon the following individuals by placing a copy of same in the United States Mail,
postage prepaid, and/or by electronic service, as follows:

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